

Claims

That which is claimed is:

1. A self-expanding stent and stent delivery system comprising:

an elongated core member having proximal and distal portions including a

5 proximal cylindrical member disposed at the distal portion of said elongated core member, and a distal cylindrical member disposed at the distal portion of said elongated core member and positioned distally of said proximal cylindrical member and being spaced apart from said proximal cylindrical member to define a gap having a predetermined length;

10 a self-expanding stent comprised of a small diameter skeletal tubular member having an outer cylindrical surface which defines a thin wall, said wall of said skeletal tubular member including a plurality of cells which are formed by a plurality of interconnected strut members, and an anchor member placed on one of said plurality of strut members and having a length less than the length of the gap between the proximal
15 cylindrical member and the distal cylindrical member, and said self-expanding stent being mounted and compressed onto said elongated core member such that said anchor member is interlocked within said gap and between said proximal cylindrical member and said distal cylindrical member to thereby retain said stent on said elongated core member; and,

20 an actuatable retaining ring is disposed around the outer cylindrical surface of said self-expanding stent for retaining said stent onto said elongated core member in a compressed state, for upon actuation, releasing said self-expanding stent to permit the stent to expand against the wall of a vessel.

2. A self-expanding stent and stent delivery system as defined in Claim 1, wherein said self-expanding stent has proximal and distal portions, and said actuatable retaining ring is disposed around the proximal portion of said stent.

5 3. A self-expanding stent and stent delivery system as defined in Claim 1, wherein said self-expanding stent has proximal and distal sections, and a first actuatable retaining ring is disposed around the distal portion of the stent and a second actuatable retaining ring is disposed around the proximal portion of the stent.

10 4. A self-expanding stent and stent delivery system as defined in Claim 1, wherein said actuatable retaining ring is formed of a material which when heated permits the compressed self-expanded stent to expand into contact with the wall of a vessel.

15 5. A self-expanding stent and stent delivery system as defined in Claim 4, including a heating element positioned in proximity to said actuatable retaining ring, and electrical conductors connected to said heating element for, upon being energized, causing the temperature of said heating element to increase thereby causing the temperature of the actuatable retaining ring to increase with the result that the actuatable retaining ring yields to permit the stent to expand against the wall of a vessel.

20

6. A self-expanding stent and stent delivery system as defined in Claim 5, in which the actuatable retaining ring is comprised of a polymeric material.

7. A self-expanding stent and stent delivery system as defined in Claim 5, in which the actuatable retaining ring takes the form of a polymeric filament.

8. A self-expanding stent and stent delivery system as defined in Claim 5, in which
5 the actuatable retaining ring is comprised of a filament formed from a hot melt polymer.

9. A self-expanding stent and stent delivery system as defined in Claim 5, in which the heating element is an electrical resistive heating element.

10 10. A self-expanding stent and stent delivery system comprising:
a delivery catheter having a lumen extending therethrough;
an elongated core member slidably disposed within the lumen of the delivery catheter;
a self-expanding stent mounted on said elongated core member; and,
15 an actuatable retaining ring disposed around said self-expanding stent for retaining said stent onto said elongated core member in a compressed state, for upon actuation, releasing said self-expanding stent to permit the stent to expand against the wall of a vessel.

20 11. A self-expanding stent and stent delivery system as defined in Claim 10, wherein said actuatable retaining ring is formed of a material which when heated yields to thereby permit the compressed self-expanded stent to expand into contact with the wall of a vessel.

12. A self-expanding stent and stent delivery system as defined in Claim 11,
including a heating element positioned in proximity to said actuatable retaining ring, and
electrical conductors connected to said heating element for, upon being energized,
5 causing the temperature of said heating element to increase thereby causing the
temperature of the actuatable retaining ring to increase with the result that the actuatable
retaining ring yields to permit the stent to expand against the wall of a vessel.

13. A self-expanding stent and stent delivery system as defined in Claim 12, in which
10 the actuatable retaining ring is comprised of a polymeric fiber.

14. A self-expanding stent and stent delivery system as defined in Claim 13, in which
the actuatable retaining ring is comprised of a filament formed from a hot melt polymer.

15 15. A self-expanding stent and stent delivery system as defined in Claim 13, in which
the heating element is an electrical resistive heating element.

16. A self-expanding stent and stent delivery system comprising:
a delivery catheter having a lumen extending therethrough;
20 an elongated core member slidably disposed within the lumen of the delivery
catheter;
a self-expanding stent mounted on said elongated core member; and,

an actuatable retaining member connected to said self expanding stent for retaining said stent onto said elongated core member in a compressed state, for upon actuation, releasing said self-expanding stent to permit the stent to expand against the wall of a vessel.

5

17. A self-expanding stent and stent delivery system as defined in claim 16, wherein said actuatable retaining member is formed of a material which when activated by electrical current causes the actuatable retaining member to release said stent.

10 18. A self-expanding stent and stent delivery system as defined in Claim 16, wherein said self-expanding stent has proximal and distal portions, and said actuatable retaining member is disposed around the proximal portion of said stent.

15 19. A self-expanding stent and stent delivery system as defined in Claim 18, wherein said actuatable retaining member is formed of a material which when heated permits the compressed self-expanded stent to expand into contact with the wall of a vessel.

20 20. A self-expanding stent and stent delivery system as defined in Claim 19, including a heating element positioned in proximity to said actuatable retaining member, and electrical conductors connected to said heating element for, upon being energized, causing the temperature of said heating element to increase thereby causing the temperature of the actuatable retaining member to increase with the result that the

actuatable retaining member yields to permit the stent to expand against the wall of a vessel.